

NEW SYNONYMS PERTAINING TO *CHELIFERA* AND GENERIC
KEY FOR NORTH AMERICAN HEMERODROMIINAE
(DIPTERA: EMPIDIDAE)

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Abstract.—Empididae previously placed in *Thanategia* Melander are shown to be species of *Chelifera* Macquart: *Chelifera defecta* (Loew) n. comb.; *Chelifera recurvata* (Melander) n. comb.; and *Chelifera stuprator* (Melander) n. comb. Males with identical terminalia possessed significant variation in the expression of crossvein dm-cu that renders it invalid as a character of generic importance. Therefore, *Thanategia* is considered here a new junior synonym of *Chelifera*. Also, *Chelifera knutsoni* Lavallee is shown to be a junior synonym of *Chelifera defecta* (= *T. defecta* (Loew)). A revised key to the genera of North American Hemerodromiinae is provided.

Aquatic dance flies (Diptera: Empididae) in the subfamily Hemerodromiinae were last revised by Melander (1947). New revisionary studies of Nearctic Hemerodromiinae now underway reveal that certain genera and species should be placed in synonymy. *Thanategia* was described as a subgenus of *Chelifera* by Melander (1928: 263; type species, *Hemerodromia defecta* Loew, 1862: 210) to accommodate those species that possessed an open cell dm (= "incomplete discal cell" or "discal cell fused with third posterior cell") due to the absence of crossvein dm-cu (= "apical crossvein"). In other respects, the three species placed in that subgenus, *Thanategia defecta* (Loew), *Thanategia recurvata* Melander, and *Thanategia stuprator* Melander, fit the concept of *Chelifera*. Without an explanation, Melander (1947) later elevated *Thanategia* to generic status.

Examination of all specimens labelled as *Thanategia* and *Chelifera* in the Canadian National Collection (CNC), Ottawa, revealed that males of *T. recurvata* were identical to males placed in the CNC and labelled as *Chelifera* "new sp. nr. *scrotifera*."

Examination of wing venation revealed that all specimens identified as *Thanategia* either completely or partially lacked crossvein dm-cu in one wing or both wings, whereas those identified as *Chelifera* possessed a complete dm-cu in both wings; thus, all specimens keyed according to Melander (1928, 1947). However, in other morphological features, including all details of male terminalia, males of "*Chelifera* new sp. near *scrotifera*" were identical to males of *Thanategia recurvata*. The same study found a male placed in the CNC as *Chelifera* "new sp. nr. *banksi*" with terminalia exactly fitting the description of *T. defecta* and identical to a paratype male of *Chelifera knutsoni* Lavallee, plus a paratype female of *C. knutsoni* with incomplete expression of dm-cu in one wing resulting in cell dm being "open" apically.

Subsequent examination of holotype males of *T. recurvata* and *T. stuprator* and additional paratype males and females of *Chelifera knutsoni* together with study of two series of specimens obtained in loans from the University of New Hampshire and Washington State University eventually

clarified the males and facilitated association of conspecific males and females.

General analysis of venation of all available males ($N = 8$) with terminalia matching the very distinctive terminalia of *recurvata* (Melander 1947: 260; fig. 34) revealed that three (including the holotype) possessed "*Thanategia* venation," three possessed "*Chelifera* venation," and two could key to *Thanategia* since cell dm was open in at least one wing. Of the four associated females, two possessed "*Chelifera* venation" and two (including the allotype) possessed an open cell dm in at least one wing. This variation in dm-cu indicates that "*T. recurvata*" simply represents individuals lacking development of dm-cu, and therefore this species is transferred to the genus *Chelifera*: *Chelifera recurvata* (Melander) (= *Thanategia recurvata* Melander), **New Combination**.

Study of a series of males ($N = 8$) with terminalia matching the description of *T. defecta* (Melander 1947: 259, fig. 32) (collected July–Oct., 1985 by D. S. Chandler near Wonalancet, New Hampshire), together with examination of two paratype males of *C. knutsoni* (collected Macon Co. North Carolina by A. G. Lavalley (1975)) and comparison of the above mentioned two males in the CNC, clarified another question. Every aspect of male terminalia among the above males was identical; however, these males varied significantly in the expression of dm-cu which, based on Melander's 1947 key, would lead to identification of half as *T. defecta* (i.e. dm-cu completely or partially absent) and half as *C. knutsoni* (i.e. dm-cu complete in both wings). A similar result would occur when keying associated females. Examination of *C. knutsoni* paratypes (two males and two females), all possessing a complete dm-cu in both wings, places them in the genus *Chelifera*. The comparison, however, of all males considered above with the general description and specific features of male terminalia of *T. defecta* results in the following nomen-

clatorial revision: *Chelifera defecta* (Loew) [= *Thanategia defecta* (Loew)] **New Combination** (= *Chelifera knutsoni* Lavalley) **New Synonym**.

The study of *T. stuprator* was puzzling for two reasons. First, all specimens first examined (four males, including the holotype, and six females) fit the description of this species (Melander 1947: 259; fig. 33) and Melander's concept of *Thanategia* based on venation. Second, in addition to lacking crossvein dm-cu diagnostic for *Thanategia*, all specimens possessed a simple R_{4+5} and thus did not possess the branched R_{4+5} typical of *Chelifera*. Melander's (1947) description of the holotype male indicated that R_4 was "vestigial," but my examination revealed that R_4 was completely lacking in the right wing and was expressed as an incomplete, approximately 2 mm, rudimentary crossvein arising from the costa in the left wing. Subsequent acquisition of a series of *T. stuprator* (collected 12-13-VIII-1977 by W. J. Turner in Mt. Ranier National Park) substantiated the suspected variability in venation. All three *stuprator* males and 25/27 associated females lacked dm-cu in both wings, but two females possessed a partial dm-cu in both wings. Variability pertaining to R_4 was as follows: the three males possessed either complete or partially complete R_4 forks in either one or both wings; 11 females expressed no development of R_4 in either wing; one female had a complete R_4 in the right wing (completely lacking in the left wing); and 14 females possessed a partial R_4 in both wings (six females) or only the right wing (four females) or only the left wing (four females). Clearly, R_4 is a trait subject to individual variability. As regards dm-cu, its absence may be typical of *stuprator*, but it is not of generic importance and this species is transferred to the genus *Chelifera*: *Chelifera stuprator* (Melander) (= *Thanategia stuprator* Melander) **New Combination**.

Variation in crossvein dm-cu also exists in other species of *Chelifera*. For example,

occasional specimens of *C. obsoleta* (Loew) from Indiana and Georgia, *C. ensifera* Melander from Oregon, *C. calaga* Lavalley from Utah, and *C. cirrata* Melander from Washington state, either lacked or possessed a partial crossvein dm-cu in one wing or both wings, and would "run to" *Thanatogea* in existing keys.

Significant variation in the expression of crossvein dm-cu revealed in the three species formerly placed in the genus *Thanatogea*, as well as in several other species of *Chelifera*, is adequate evidence for placing *Thanatogea* Melander as a junior synonym of *Chelifera* Macquart, **New Synonym**, as has been shown here by the correct generic placement of the type species and the other two described species of the former genus.

An additional consequence of this study is the revision of the last portion of Melander's (1947) key and the related portion of Steyskal and Knutson's (1981) key to North American genera of Hemerodromiinae, which is here reproduced in its entirety with the needed modifications stemming from this study, as well as a few additional minor changes:

1. Antenna with an arista, more than twice as long as basal flagellomere; mesoscutum with several pairs of well developed setae; laterotergite with setae; male terminalia more or less reflexed over abdomen, with terminal processes projecting anteriorly 2
- 1'. Antenna with a stylus, shorter than basal flagellomere; mesoscutum without well developed setae (a pair of supra-alars may exist); laterotergite bare; male terminalia erect or projecting posteriorly 3
2. Cell dm closed apically (crossvein dm-cu present) *Chelipoda* (*Chelipoda*) Macquart
2. Cell dm open apically (crossvein dm-cu absent) *Chelipoda* (*Phyllodromia*) (some authors treat *Phyllodromia* as a separate genus, *Phyllodromia* Zetterstedt)
3. Anal cell absent and CuA₂ not developed; R₁ ending before mid-wing; Sc fused with C close to wing base; crossvein h absent *Hemerodromia* Meigen
- 3'. Anal cell present, or at least CuA₂ strongly developed; R₁ ending at or beyond mid-wing; Sc distinctly free of C, but evanescent apically; crossvein h present 4

4. Veins M₁ and M₂ not petiolate (i.e. without a common stem); cell dm fused basally with cell bm; front femur relatively slender and typically lacking strong setae beneath *Neoplasta* Coquillett
- 4'. Veins M₁ and M₂ petiolate (i.e. with a common stem); cell dm variable; front femur swollen and possessing strong setae beneath 5
5. Cells bm and dm fused (i.e. crossvein bm-cu absent) *Metachela* Coquillett
- 5'. Cells bm and dm separate (i.e. crossvein bm-cu present); crossvein dm-cu usually present, but occasionally partially or totally lacking, opening cell dm apically (the two wings may differ in this regard on the same specimen) *Chelifera* Macquart (Includes *Thanatogea defecta*, *T. recurvata*, and *T. stuprator*)

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